

**WHAT IS CLAIMED IS:**

- 1        1. A method of manufacturing an ink jet printing module comprising:  
2              contacting a first component of an ink jet printing module having a surface with a  
3              thermoplastic bonding component; and  
4              heating the surface to bond the surface to the thermoplastic bonding component.
- 1        2. The method of claim 1, further comprising applying pressure to the surface and the  
2              thermoplastic bonding component.
- 1        3. The method of claim 2, wherein pressure is applied during heating.
- 1        4. The method of claim 1, wherein the surface and the thermoplastic bonding  
2              component are substantially free of liquid adhesive.
- 1        5. The method of claim 1, further comprising contacting a second component of the  
2              ink jet printing module having a surface with the thermoplastic bonding component; and  
3              heating the surface to bond the surface to the thermoplastic bonding component.
- 1        6. The method of claim 1, wherein the first component of the ink jet printing module  
2              is a piezoelectric element.
- 1        7. The method of claim 6, wherein the thermoplastic bonding component includes an  
2              electrode pattern.
- 1        8. The method of claim 6, wherein the piezoelectric element is lead zirconium  
2              titanate.
- 1        9. The method of claim 1, wherein the thermoplastic bonding component has a  
2              thickness between 1 micron and 150 microns.
- 1        10. The method of claim 1, wherein the thermoplastic bonding component has a  
2              thickness between 10 micron and 125 microns.

1           11. The method of claim 1, wherein the thermoplastic bonding component has a  
2 thickness between 20 microns and 50 microns.

1           12. The method of claim 1, wherein the thermoplastic bonding component includes  
2 an adhesive polyimide.

1           13. The method of claim 1, wherein the ink jet printing module includes an ink  
2 channel, the piezoelectric element being positioned to subject ink within the channel to  
3 jetting pressure, and electrical contacts arranged for activation of the piezoelectric element.

1           14. The method of claim 13, wherein the ink jet printing module includes a series of  
2 channels.

1           15. The method of claim 13, wherein the thermoplastic bonding component is placed  
2 over the ink channel and includes a filter.

1           16. The method of claim 15, wherein the filter includes a repeating pattern of units  
2 having a plurality of openings.

1           17. The method of claim 16, wherein a land between the units is at least 50 microns.

1           18. The method of claim 1, wherein the module includes an orifice plate and the  
2 method further comprises adhering a protector strip over the orifice plate.

1           19. The method of claim 18, wherein the orifice plate includes a thermoplastic  
2 bonding material adjacent to the protector strip.

1           20. The method of claim 18, wherein the protector strip includes a thermoplastic  
2 bonding material adjacent to the orifice strip.

1           21. A method of manufacturing an ink jet printing module comprising:  
2 contacting a first component of an ink jet printing module having a surface with a

3 thermoplastic bonding component;  
4 contacting a second component of the ink jet printing module having a surface with  
5 the thermoplastic bonding component; and  
6 heating the surface to bond the surfaces to the thermoplastic bonding component.

1 22. The method of claim 21, further comprising applying pressure to the surface and  
2 the thermoplastic bonding component.

1 23. The method of claim 21, wherein pressure is applied during heating.

1 24. The method of claim 21, wherein the surface and the thermoplastic bonding  
2 component are substantially free of liquid adhesive.

1 25. The method of claim 21, wherein the first component of the ink jet printing  
2 module is a piezoelectric element.

1 26. The method of claim 21, wherein the ink jet printing module includes an ink  
2 channel, the piezoelectric element being positioned to subject ink within the channel to  
3 jetting pressure, and electrical contacts arranged for activation of the piezoelectric element.

1 27. The method of claim 26, wherein the thermoplastic bonding component is placed  
2 over the ink channel and includes a filter including a repeating pattern of units having a  
3 plurality of openings and a land between the units is at least 50 microns.

1 28. The method of claim 21, wherein the module includes an orifice plate and the  
2 method further comprises adhering a protector strip over the orifice plate.

1 29. An ink jet printing module comprising a piezoelectric element having a surface,  
2 and a thermoplastic bonding component heat-bonded to the surface.

1 30. The ink jet printing module of claim 29, wherein the thermoplastic bonding  
2 component includes a first surface heat-bonded to the surface of the piezoelectric element  
3 and a second surface heat-bonded to a surface of an ink jet printing module component.

1           31. The ink jet printing module of claim 29, wherein the thermoplastic bonding  
2 component includes an electrode pattern.

1           32. The ink jet printing module of claim 29, wherein the piezoelectric element is lead  
2 zirconium titanate.

1           33. The ink jet printing module of claim 29, wherein the thermoplastic bonding  
2 component has a thickness between 1 micron and 150 microns.

1           34. The ink jet printing module of claim 29, wherein the thermoplastic bonding  
2 component has a thickness between 10 micron and 125 microns.

1           35. The ink jet printing module of claim 29, wherein the thermoplastic bonding  
2 component has a thickness between 20 microns and 50 microns.

1           36. The ink jet printing module of claim 29, wherein the thermoplastic bonding  
2 component includes an adhesive polyimide.

1           37. The ink jet printing module of claim 29, further comprising an ink channel, the  
2 piezoelectric element being positioned to subject ink within the channel to jetting pressure,  
3 and electrical contacts arranged for activation of the piezoelectric element.

1           38. The ink jet printing module of claim 37, further comprising a series of channels.

1           39. The ink jet printing module of claim 38, wherein each of said channels is covered  
2 by a single piezoelectric element.

1           40. The ink jet printing module of claim 37, wherein the thermoplastic bonding  
2 component covers the ink channel and includes a filter.

1           41. The ink jet printing module of claim 40, wherein the filter including a repeating  
2       pattern of units having a plurality of openings and a land between the units is at least 50  
3       microns.

1 42. The ink jet printing module of claim 41, wherein the width is 300 to 495 microns.

1           43. The ink jet printing module of claim 29, further comprising an orifice plate and a  
2        protector strip adhered to the orifice plate, wherein either the orifice plate or the protector  
3        strip includes a thermoplastic bonding material.